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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/828,882	04/21/2004	Junichi Sato	09792909-5921	5622

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EXAMINER

SCHILLINGER, LAURA M

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 08/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/828,882

Applicant(s)

SATO ET AL.

Examiner

Laura M. Schillinger

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 August 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 53-63 and 126-129 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 53-63 and 126-129 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4/21/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 58 and 62 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 58, 62 recite:

58. (Original) A semiconductor thin film according to claim 53, wherein a density of said microprojections is in a range of 1 x 10<sup>10</sup> pieces/cm<sup>2</sup> or less.

62. A semiconductor thin film according to claim 53, wherein said semiconductor thin film contains a single crystal region having a size of 1 x 10<sup>-8</sup> cm<sup>2</sup> or more.

Appropriate correction is necessary.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an

international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 53-55, 60-61, 63, 126-127 and 129 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamaguchi et al ('294).

Yamaguchi teaches the following claimed limitations as cited below:

53. (Currently amended) A semiconductor thin film formed on an insulating base, comprising: microprojections formed on the surface of said semiconductor thin film (Fig.2b(S1)).

54. (Original) A semiconductor thin film according to claim 53. wherein said micro-projections are arranged in an approximately regular pattern (Fig.2b (S1) and Col.7, lines: 25-45).

55. (Original) A semiconductor thin film according to claim 53, wherein a height of each of said micro-projections is in a range of 20 nm or less (Fig.2b (portions of the microprojection have a height of 0- under the interpretation that the *maximum* height of the projections is 20nm- a 103 rejection is made below).

60. (Original) A semiconductor thin film according to claim 53, wherein said micro-projections are formed by uplift of boundary portions among polycrystalline grains in said semiconductor thin film (Col.7, lines: 50-60).

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61. (Original) A semiconductor thin film according to claim 53. wherein said semiconductor thin film is made of non-single crystals, single crystals, or a combination thereof (Col.7, lines: 60-65).

63. A semiconductor thin film according to claim 53, wherein said semiconductor thin film contains a single crystal region having an orientation plane which is either of the (100), (111), and (110) planes (Col.7, lines: 30-35).

126. (Currently amended) A semiconductor thin film according to claim 53. further comprising said insulating base; and wherein:

said semiconductor thin film comprises a polycrystalline thin film formed in on said insulating base (Col.7, lines: 15-25 and Fig.2a);

said polycrystalline thin film has polycrystalline grains are aligned in an approximately regular pattern (Fig.2b)); and

said micro-projection are each formed at a boundary position among at least three or more of said polycrystalline grains (Fig.2f ( $S_{n-1}$ )- the projections are the result of 3 or more intersecting grain boundaries as depicted by the figure).

127. (Original) A semiconductor thin film according to claim 126, wherein said microprojections are aligned in an approximately regular pattern (Fig.2b).

129. (Original) A semiconductor thin film according to claim 126, wherein a size of each of said polycrystalline grains is in a range of 0.1 um to 4.0 um (Col.7, lines: 20-25).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 55-56, 59 and 128 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al ('294).

Yamaguchi teaches similar ranges for the following claimed limitations as cited below:

55. (Original) A semiconductor thin film according to claim 53, wherein a height of each of said micro-projections is in a range of 20 nm or less (Fig.2b (range as high as 0.3 um (Col.7, lines: 25-45 and Fig.2b).

56. (Original) A semiconductor thin film according to claim 53, wherein a diameter of each of said micro-projections is in a range of 0.1 um or less (Col.7, lines: 30-40).

59. (Original) A semiconductor thin film according to claim 53, wherein a thickness of said semiconductor thin film is in a range of 50 nm or less (Col.7, lines: 15-20).

128. (Original) A semiconductor thin film according to claim 126, wherein a thickness of said semiconductor thin film is in a range of 50 nm or less (Col.7, lines: 15-25).

These claims are prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also In re Huang, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996) (claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also In re Boesch, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill of art) and In re Aller, 105 USPQ 233 (CCPA 1955) (selection of optimum ranges within prior art general conditions is obvious).

**Claim 57 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al ('294) as applied to claim 53 above, and further in view of Nakata ('173).**

57. Yamaguchi teaches a semiconductor thin film according to claim 53, however fails to teach wherein a radius of curvature of each of said microprojections is in a range of 60 nm or more. However, Nakata teaches having rounded tipped projections (Fig.s 5-6). Therefore there is a

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radius of curvature to the projection which can exceed 60 nm based upon Nakata's sizings (Col.10, lines: 10-20). This claim is prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also In re Huang, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996) (claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also In re Boesch, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill of art) and In re Aller, 105 USPQ 233 (CCPA 1955) (selection of optimum ranges within prior art general conditions is obvious).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura M. Schillinger whose telephone number is (571) 272-1697. The examiner can normally be reached on M-T, R-F 7:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read "Laura M Schillinger", with a stylized, flowing script.

Laura M Schillinger  
Primary Examiner  
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08/18/06